

Claims

- [1] A digital broadcasting transmitter, including:
 - a randomizer for receiving and randomizing a data stream inserted with stuff bytes at a certain location;
 - a sequence provider for generating known data having a particular sequence to replace the stuff bytes;
 - a stuff byte replacer for inserting the known data at the location of the randomized data stream where the stuff bytes are inserted;
 - an encoder for encoding the data stream output from the stuff byte replacer for error-correction; and
 - a transmission part for modulating, RF-converting and transmitting the encoded data stream.
- [2] The transmitter as claimed in claim 1, wherein the data stream includes the information on the certain location where the stuff bytes are inserted.
- [3] The transmitter as claimed in claim 2, wherein the information is inserted prior to the location where the stuff bytes are inserted and includes the information on the length of the stuff data.
- [4] The transmitter as claimed in claim 3, further including a control signal generator for generating a control signal to control the stuff byte replacer to insert the known data at the location according to the information.
- [5] The transmitter as claimed in claim 1, wherein the encoder includes:
 - an RS encoder for adding a parity of certain bytes to correct errors generated by channels;
 - an interleaver for interleaving the data added with the parity in a certain pattern; and
 - a trellis encoder for trellis-encoding the interleaved data.
- [6] The transmitter as claimed in claim 5, wherein the trellis encoder has a memory element for trellis encoding operation and initializes the memory element from the location inserted with the known data for trellis-encoding.
- [7] The transmitter as claimed in claim 6, further including a packet buffer for receiving and temporarily storing the data stream from the RS encoder.
- [8] The transmitter as claimed in claim 7, wherein the packet buffer receives the data altered according to the initialization of the memory element from the trellis encoder and updates the stored data.
- [9] The transmitter as claimed in claim 8, further including a RS re-encoder & replace parity for RS-encoding the updated data input from the packet buffer, generating the altered parity, outputting the parity to the trellis encoder and

- [10] replacing the parity added by the RS encoder.
- [11] The transmitter as claimed in claim 1, wherein the interleaver outputs known data inserted at the same location of a plurality of different data streams output from the RS encoder in continuous data streams.
- [12] The transmitter as claimed in claim 1, wherein the transmission part modulates the data in VSB modulation.
- [13] A signal processing method for digital broadcasting transmission, including:
receiving and randomizing a data stream inserted with stuff bytes at a certain location;
generating a predefined particular sequence as known data;
inserting the known data at the location inserted with the stuff bytes of the randomized data stream;
encoding the data stream inserted with the known data for error-correction; and
modulating, RF-converting and transmitting the encoded data stream.
- [14] The method as claimed in claim 12, wherein the encoding step includes:
an RS encoding step of adding parity of certain bytes to correct errors generated by channels;
an interleaving step of interleaving the data added with the parity in a certain pattern; and
a trellis encoding step of trellis-encoding the interleaved data.
- [15] The method as claimed in claim 13, wherein the trellis encoding step initializes the memory element at the location where the known data are inserted for a pre-determined memory element used for trellis encoding so that the trellis encoding is performed.
- [16] The method as claimed in claim 14, further including:
receiving and temporarily storing the data stream generated in the RS encoding step, receiving the data altered according to the initialization of the memory element from the trellis encoding step, and performing a update.
- [17] The method as claimed in claim 15, further including:
a parity restructuring step of performing RS encoding of the encoded data, generating an altered parity, returning to the trellis encoding step, replacing and adding the parity added in the RS encoding step, and performing trellis encoding.
- [18] The method as claimed in claim 12, wherein the transmitting step modulates the data in VSB modulation.
- [18] A digital broadcasting receiver, including:
a demodulator for inserting known data of a predefined particular sequence at a location in a data stream inserted with stuff bytes at the certain location,
receiving the encoded signal from a digital broadcasting transmitter and de-

- modulating the signal into a baseband signal;
a known data detector for detecting the known data from the demodulated signal;
and
an equalizer for equalizing the demodulated signal using the detected known data.
- [19] The receiver as claimed in claim 18, wherein the known data detector includes:
a symbol number detector for detecting the information on the certain location inserted with the known data from a received signal;
a segment flag generator for generating a data frame including at least one segment whose location is marked with a predetermined flag;
a trellis interleaver for performing error-correction encoding performed in the digital broadcasting transmitter for the data frame; and
a known data extractor for inserting the known data at the location marked with the flag of the encoded data frame and outputting the data.
- [20] The receiver as claimed in claim 18, wherein the known data detector outputs the detected known data to the demodulator and the demodulator performs de-modulation using the known data.
- [21] A signal processing method for digital broadcasting reception, including:
inserting known data having a predefined particular sequence at the location for a data stream inserted with stuff bytes at a certain location, receiving an encoded signal from a digital broadcasting transmitter and demodulating the signal into a baseband signal;
detecting the known data from the demodulated signal; and
equalizing the demodulated signal using the detected known data.
- [22] The method as claimed in claim 21, wherein the known data detecting step includes:
detecting the information on the certain location inserted with the known data from a received signal;
generating a data frame including at least one segment whose location is marked with a predetermined flag;
performing error-correction encoding performed in the digital broadcasting transmitter for the data frame; and
inserting the known data at the location marked with the flag of the encoded data frame and outputting the data.
- [23] The method as claimed in claim 21, wherein the known data detecting step outputs the detected known data to the demodulating step and the demodulating step performs demodulation using the known data.